IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): An information processing apparatus including processor means for executing an operation ~~and storage means for storing an instruction or data for said processor means to execute the operation~~, the information processing apparatus comprising:

a plurality of functional units for performing functional processes;

storage means for storing said instruction and data for said processor means to execute said operation and including input/output registers for transferring said instruction and data between said processor means and said functional units;

~~at least~~ first and second transfer means for transferring said instruction or data between said processor means and said storage means; ~~and~~

~~at least one~~ first address translation means for translating [[a]] an instruction virtual address designated by said processor means into a physical address of said storage means[[,]]; and

second address translation means for translating a data virtual address including the virtual addresses of said data and said input/output registers designated by said processor means into a physical address of said storage means,

wherein each of said first and second transfer means includes an independent respective first and second virtual address space each including virtual addresses, wherein the virtual addresses in the first virtual address space overlap with the virtual addresses in the second virtual address space; ~~and~~

said first and second address translation means ~~translates~~ translate said virtual address space of said respective first and second transfer means into a single physical address space; and

the data virtual address space of said input/output registers and data are divided and disposed in a plurality of address areas so that the virtual addresses of an instruction and corresponding data and input/output registers are disposed at a near distance.

Claim 2 (Previously Presented): The information processing apparatus according to claim 1, wherein:

said first and second transfer means include an instruction bus for transferring said instruction and a data bus for transferring said data; and

a difference between a virtual address of an instruction accompanying an access to said first and second transfer means and a virtual address of data accessed by said instruction is equal to or shorter than a distance which can be directly designated as a relative address by an operand of the instruction.

Claim 3 (Previously Presented): The information processing apparatus according to claim 1, further comprising:

a cache, provided for each of said first and second transfer means, said cache using said virtual address as a tag.

Claim 4 (Original): The information processing apparatus according to claim 3,

wherein said virtual address space includes virtual addresses in such a manner that a border between a virtual address of said instruction and a virtual address of said data becomes a line border of said cache.

Claim 5 (Previously Presented): The information processing apparatus according to claim 1, further comprising:

a cache for making a distinction between said first and second transfer means and identifying cache data.

Claim 6 (Original): The information processing apparatus according to claim 5,

wherein said virtual address space includes virtual addresses in such a manner that a border between a virtual address of said instruction and a virtual address of said data becomes a line border of said cache.

Claim 7 (Original): The information processing apparatus according to claim 1,

wherein if a translation unit of an address to be translated by said address translation means contains both a virtual address of said instruction and a virtual address of said data, data included in said translation unit is only constant data.

Claim 8 (Previously Presented): The information processing apparatus according to claim 1,

wherein said address translation means translates said virtual address space of said respective first and second transfer means into said single physical address space having mutually non-overlapping addresses.

Claim 9 (Original): The information processing apparatus according to claim 1,

wherein said storage means includes a write inhibited area and a write permitted area; and

virtual addresses of both said write inhibited area and said write permitted area are disposed in a virtual address space in a range that can be directly designated as a relative address by an operand of an instruction accompanying an access to said storage means.

Claim 10 (Original): The information processing apparatus according to claim 1, wherein said storage means includes at least one input/output (I/O) register; and

a difference between a virtual address of said instruction accompanying an access to said I/O register and a virtual address representative of said I/O register is equal to or shorter than a distance that can be directly designated as a relative address by an operand of said instruction.

Claim 11 (Original): The information processing apparatus according to claim 10, wherein a virtual address representative of a same I/O register is divided and disposed in a plurality of areas of said virtual address space.

Claim 12 (Original): The information processing apparatus according to claim 1, wherein said address translation means translates upper n bits of said virtual address of (n + m) bits, and at least one bit or more of the translated upper n bits is exchanged with at least one or more bits of the remaining m bits, thereby translating said virtual address into said physical address.

Claim 13 (Original): The information processing apparatus according to claim 1, wherein said address translation means translates upper n bits of said virtual address of (n + m) bits, and at least one bit or more of the remaining lower m bits is exchanged with another one bit or more of the remaining lower m bits, thereby translating said virtual address into said physical address.

Claim 14 (Currently Amended): An information processing method for an information processing apparatus, the information processing apparatus including:

processor means for executing an operation;

~~storage means for storing an instruction or data for said processor means to execute the operation;~~

a plurality of functional units for performing functional processes;

storage means for storing said instruction and data for said processor means to execute said operation and including input/output registers for transferring said instruction and data between said processor means and said functional units;

~~at least~~ first and second transfer means for transferring said instruction or data between said processor means and said storage means; ~~and~~

~~at least one~~ first address translation means for translating [[a]] an instruction virtual address designated by said processor means into a physical address of said storage means[[,]]; and

second address translation means for translating a data virtual address including the virtual addresses of said data and said input/output registers designated by said processor means into a physical address of said storage means,

wherein each of said first and second transfer means includes an independent respective first and second virtual address space each including virtual addresses, wherein the virtual addresses in the first virtual address space overlap with the virtual addresses in the second virtual address space; ~~and~~

~~said~~ first and second address translation means ~~includes~~ include a translation step of translating said virtual address space of said respective first and second transfer means into a single physical address space; and

the data virtual address space of said input/output registers and data are divided and disposed in a plurality of address areas so that the virtual addresses of an instruction and corresponding data and input/output registers are disposed at a near distance.

Claim 15 (Canceled).

Claim 16 (Currently Amended): A storage medium storing a computer readable program for an information processing apparatus, the information processing apparatus comprising:

processor means for executing an operation;

~~storage means for storing an instruction or data necessary for said processor means to execute the operation;~~

a plurality of functional units for performing functional processes;

storage means for storing said instruction and data for said processor means to execute said operation and including input/output registers for transferring said instruction and data between said processor means and said functional units;

~~at least~~ first and second transfer means for transferring said instruction or data between said processor means and said storage means; ~~and~~

~~at least one~~ first address translation means for translating [[a]] an instruction virtual address designated by said processor means into a physical address of said storage means[[,]]; and

second address translation means for translating a data virtual address including the virtual addresses of said data and said input/output registers designated by said processor means into a physical address of said storage means,

wherein each of said first and second transfer means includes an independent respective first and second virtual address space each including virtual addresses, wherein the virtual addresses in the first virtual address space overlap with the virtual addresses in the second virtual address space; ~~and~~

said first and second address translation means ~~includes~~ include a translation step of translating said virtual address space of said respective first and second transfer means into a single physical address space; and

the data virtual address space of said input/output registers and data are divided and disposed in a plurality of address areas so that the virtual addresses of an instruction and corresponding data and input/output registers are disposed at a near distance.

Claims 17-19 (Canceled).

Claim 20 (Currently Amended): An imaging apparatus comprising:

imaging means for taking an image of an object;

encoding means for encoding image data of the object taken with said imaging means;

processor means for executing an operation of designating an instruction or data for said encoding means to encode said image data; and

~~storage means for storing said instruction or data for said processor means to execute an operation,~~

wherein the imaging apparatus further comprises:

a plurality of functional units for performing functional processes;

storage means for storing said instruction and data for said processor means to execute said operation and including input/output registers for transferring said instruction and data between said processor means and said functional units;

~~at least~~ first and second transfer means for transferring said instruction or data between said processor means and said storage means; ~~and~~

~~at least one~~ first address translation means for translating [[a]] an instruction virtual address designated by said processor means into a physical address of said storage means[[,]]; and

second address translation means for translating a data virtual address including the virtual addresses of said data and said input/output registers designated by said processor means into a physical address of said storage means,

wherein each of said first and second transfer means includes an independent respective first and second virtual address space each including virtual addresses, wherein virtual addresses in the first virtual address space overlap with the virtual addresses in the second virtual address space;

said first and second address translation means ~~translates~~ translate said virtual address space of said respective first and second transfer means into a single physical address space; ~~and~~

the data virtual address space of said input/output registers and data are divided and disposed in a plurality of address areas so that the virtual addresses of an instruction and corresponding data and input/output registers are disposed at a near distance, and

said encoding means encodes said image data in accordance with said instruction or data in said storage means corresponding to an address designated by said processor means and translated by said address translation means.

Claim 21 (Currently Amended): An information processing apparatus including a processor for executing an operation ~~and a storage for storing an instruction or data for said processor to execute the operation~~, the information processing apparatus comprising:

a plurality of functional units for performing functional processes;

a storage for storing said instruction and data for said processor to execute said operation and including input/output registers for transferring said instruction and data between said processor and said functional units;

~~at least~~ first and second transfer sections for transferring said instruction or data between said processor and said storage; ~~and~~

~~at least one~~ a first address translator for translating a virtual address designated by said processor into a physical address of said storage[[,]]; and

a second address translator for translating a data virtual address including the virtual addresses of said data and said input/output registers designated by said processor into a physical address of said storage means,

wherein each of said first and second transfer sections includes an independent respective first and second virtual address space each including virtual addresses, wherein virtual addresses in the first virtual address space overlap with the virtual addresses in the second virtual address space; ~~and~~

said first and second address ~~translator translates~~ translators translate said virtual address space of said respective first and second transfer sections into a single physical address space; and

the data virtual address space of said input/output registers and data are divided and disposed in a plurality of address areas so that the virtual addresses of an instruction and corresponding data and input/output registers are disposed at a near distance.

Claim 22 (Currently Amended): An imaging apparatus comprising:

an imaging section for taking an image of an object;

an encoder for encoding image data of the object taken with said imaging section;

a processor for executing an operation of designating an instruction or data for said encoder to encode said image data; ~~and~~

~~a storage for storing said instruction or data for said processor to execute an operation,~~

wherein the imaging apparatus further comprises:

a plurality of functional units for performing functional processes;

a storage means storing said instruction and data for said processor to execute said operation and including input/output registers for transferring said instruction and data between said processor and said functional units;

~~at least~~ first and second transfer sections for transferring said instruction or data between said processor and said storage; ~~and~~

~~at least one~~ a first address translator for translating a virtual address designated by said processor into a physical address of said storage[[,]]; and

a second address translator for translating a data virtual address including the virtual addresses of said data and said input/output registers designated by said processor into a physical address of said storage means,

wherein each of said first and second transfer sections includes an independent respective first and second virtual address space each including virtual addresses, wherein the virtual addresses in the first virtual address space overlap with the virtual addresses in the second virtual address space;

said first and second address ~~translator translates~~ translators translate said virtual address space of said respective first and second transfer sections into a single physical address space; and

the data virtual address space of said input/output registers and data are divided and disposed in a plurality of address areas so that the virtual addresses of an instruction and corresponding data and input/output registers are disposed at a near distance.

said encoder encodes said image data in accordance with said instruction or data in said storage corresponding to an address designated by said processor and translated by said address translation section.